NASA Procedural Requirements

NPR 7123.1A
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COMPLIANCE IS MANDATORY

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Subject: NASA Systems Engineering Processes and Requirements

Responsible Office: Office of the Chief Engineer

Chapter 2. Institutional and Programmatic Requirements

2.1 Roles and Responsibilities

2.1.1 General

2.1.1.1

The roles and responsibilities of senior management are defined in part in NPD 1000.0, Strategic Management & Governance Handbook. NPR 7120.5, NASA Space Flight Program and Project Management Requirements; NPD 7120.4, Program/Project Management; and other NASA directives define the responsibilities of program and project managers. This NPR establishes systems engineering processes and responsibilities.

2.1.1.2

The OCE, under the authority of this SE NPR, shall ensure compliance with this SE NPR.

2.1.1.3

For programs and projects involving more than one Center, the lead organization shall develop documentation to describe the hierarchy and reconciliation of Center plans implementing this NPR. The governing mission directorate determines whether a Center executes a project in a lead role or in a peer role. For Centers in peer roles, compliance should be jointly negotiated.

2.1.1.4

For systems that contain software, the technical team shall ensure that software developed within NASA or acquired complies with NPD 2820.1, NASA Software Policy, and NPR 7150.2, NASA Software Engineering Requirements. Note that NPR 7150.2 elaborates on the requirements in this document and determines the applicability of requirements based on the Agency's software classification. Also note that NPR 7150.2 contains additional Agency requirements for the acquisition, development, maintenance, and management of software.

2.1.1.5

The OCE shall be the clearinghouse for systems engineering policies to ensure compatibility across NASA. In the event of differences between program or project offices and the OCE staff, the conflict will ultimately reach the NASA Chief Engineer or mission director level. If agreement is not achieved at this level, the conflict will be brought to the NASA Administrator for resolution.

2.1.1.6

In this document, the phrase "the Center Directors shall..." means the roles and responsibilities of the Center Directors may be further delegated within the organization as appropriate to the scope and scale of the system.

2.1.2 Center Directors

2.1.2.1

Center Directors oversee and manage the infrastructure for the successful execution of technical authority, support, and assurance of all programs and projects.

2.1.2.2

Center Directors shall perform the following activities or delegate them to the appropriate Center organization:

a. Develop the SE NPR Implementation Plan per the template in Appendix H-1 describing how the requirements of this SE NPR will be applied to the programs and projects under their cognizance or authority.

b. Establish policies, procedures, and processes to execute the requirements of this SE NPR.

c. Assess and take corrective actions to improve the execution of the requirements of this SE NPR.

d. Perform the SE NPR Center Survey in accordance with Appendix H-2 for the purpose of providing feedback on the SE NPR. The initial Center Survey will be submitted five months from the effective date of this SE NPR. Subsequent updates will be upon the request of the OCE, no earlier than nine months after the initial submission. The Center Survey will use the common survey tool in Appendix H-2 and will be submitted through the Center System Engineering Working Group (SEWG) representative.

e. Select appropriate standards applicable to projects under their control.

2.1.3 Technical Teams

Each technical team shall execute the Center processes intended to implement this SE NPR under the oversight of the Center Directors in accordance with the SEMP. The makeup and organization of each technical team is the responsibility of each Center or program and includes the personnel required to implement the project.

2.2 Implementation Architecture

2.2.1 Implementation Plan

2.2.1.1

Figure 2-1 illustrates the engineering implementation flow and key documents. NPD 7120.4 establishes the policy for engineering and program and project management for the Agency. From that directive, the OCE developed and published this SE NPR, which is consistent and complementary to NPR 7120.5 and other pertinent Agency directives. The requirements established in this SE NPR will flow down to the implementing organizations and Centers.

2.2.1.2

The Center Directors shall submit their SE NPR Implementation Plan to the OCE within three months after the effective date of this NPR. The plan will be updated as required. The SE NPR Implementation Plan will be provided to mission directorates for review and comment. Each SE NPR Implementation Plan will be approved by the OCE and include the applicable documents employed by the individual Centers. These Center documents may include Center procedural requirements, work instructions, standards, and rules, as well as other Center-unique documentation. The SE NPR is a requirements document that specifies what needs to be accomplished at an Agency level. There will also be a body of knowledge developed to assist in the implementation of the NPR. This body of knowledge will include an updated NASA Systems Engineering Handbook (SP-6105) as well as best practices, standards, and templates.

2.2.1.3

The Center Directors shall develop and document in the SE NPR Implementation Plan how the particular Center will assess compliance to the SE NPR and provide regular updates to the OCE. In addition, the OCE will conduct periodic updates at the Centers to obtain feedback on the effectiveness of the SE NPR to facilitate updating the NPR.

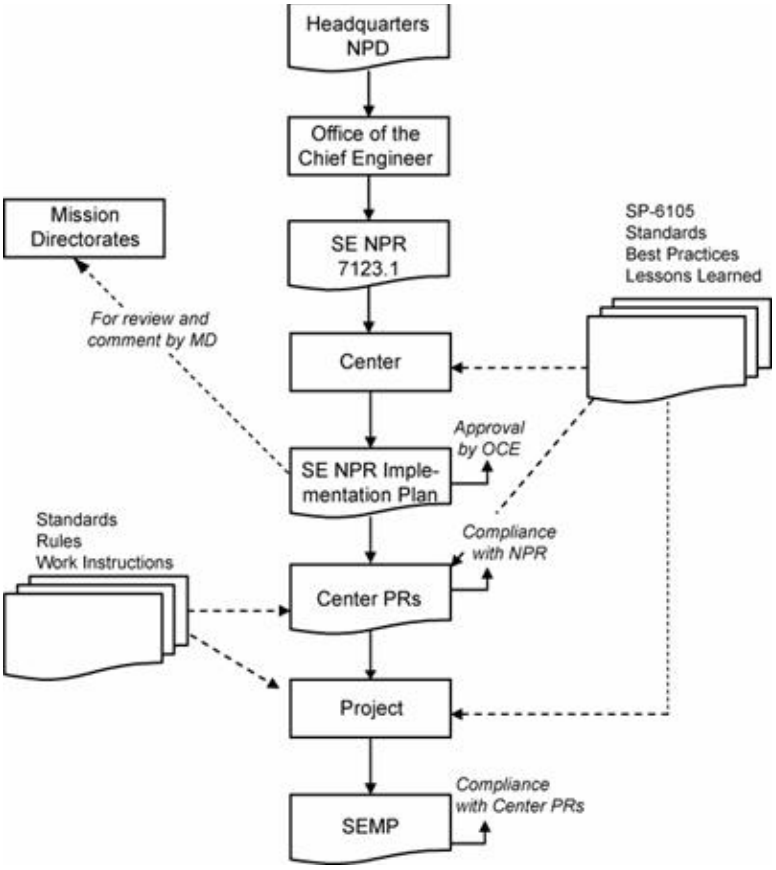

Figure 2-1 Implementation Architecture

2.3 Designated Governing Authority

The designated governing authority (DGA) for the technical effort in this SE NPR is the Center Director or the person or organization that has been designated by them to ensure the appropriate level of technical management oversight. The DGA is assigned primary responsibility for evaluating the technical content of a particular program or project to ensure that it is meeting the commitments specified in the key management documents. Typically, the DGA is the final approval signature on the Systems Engineering Management Plans, waiver authorizations, and other key technical documents. While overall management of the project SEMPs, technical reviews, and similar project-specific SE products and reviews is the responsibility of the program/project manager, who is expected to sign the documents, the DGA has the final approval signature to ensure independent assessment of technical content and waiver authorizations that pertain to this NPR.

2.3.1 Tailoring and Waivers

2.3.1.1

The appropriate DGA shall have responsibility to approve or disapprove any SE NPR requirement that is either tailored or waived. Approved tailoring or waivering will be documented in the SEMP, as per the directions provided in appendices D and F.

2.3.1.2

The amount of detail, formality, and rigor required for the implementation of this SE NPR's requirements is tailorable based on the size and complexity of each project and acceptable risk, subject to approval by the project manager and the DGA. Critical project considerations (e.g., public safety, security, litigation exposures) may preclude tailoring out required process activities, regardless of cost, manpower available, or other considerations.

2.3.1.3

A waiver is a documented agreement intentionally releasing a program or project from meeting a requirement. Waivers are required to release a program or project from meeting a requirement in the execution of the processes described in this SE NPR.

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